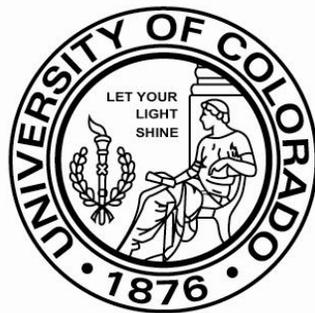


University of Colorado

Department of Obstetrics & Gynecology



Resident Research Day
June 3, 2022

Guest Speaker



J. Christopher Carey, MD

Director of Service, Denver Health Medical Center
Department of Obstetrics and Gynecology, Retired

J. Chris Carey, MD, is retired as Director of Obstetrics and Gynecology and Director of Education for Denver Health. He was also Professor of Obstetrics & Gynecology and Associate Dean for the University of Colorado School of Medicine.

Dr. Carey grew up in Checotah, Oklahoma. He graduated from Oklahoma State University and Baylor College of Medicine. He completed an internship and residency in Gynecology and Obstetrics at the University of Oklahoma. He served on the faculty as Professor at the University of Oklahoma; Professor at Pennsylvania State University; Chair of OB/GYN for Maricopa County Integrated Health System and Residency Program Director for the Phoenix Integrated Residency Program and Professor of Clinical Medicine at the University of Arizona; and Director of Obstetrics and Gynecology for Denver Health and Professor and Associate Dean at the University of Colorado. He also served as a Special Assistant for Obstetrics in the Epidemiology, Statistics and Prevention Research Branch of the NICHD.

He is married to his wife of 48 years, Marsha Carey. He is currently retired and occupies his time losing money by breeding quarter horses.

**RESIDENT RESEARCH DAY
SCIENTIFIC PROGRAM**

Resident Research Day Award Committee

**Meredith Alston, MD
Nancy Fang, MD, MS
Thomas Jansson, MD, PhD
Nicki Nguyen, MD
Nanette Santoro, MD**

RESIDENT RESEARCH DAY SCIENTIFIC PROGRAM

[Join via Zoom](#)

Breakfast

7:30-8:00AM

Welcoming Remarks

8:00-8:15AM

Christine Conageski, MD, MCSC

Aaron Lazowitz, MD, MSCS

Claire Schultz, MD, MPH

RESIDENT PRESENTATIONS

8:15-8:25AM

Association Between Pharmaceutical Industry Non-Research Payments and Ob/Gyn Physician Prescribing Practices: A Cross-Sectional Analysis

Resident: Sydney Archer, MD, MPH

Primary Mentor: Tyler Muffly, MD

Collaborators: Jeanelle Sheeder, PhD; Brittany Bastow, MD; Joe Guido, MS; John Schwartz, PhD

Objectives: To evaluate the association between Ob/Gyn physicians' prescribing practices and the receipt of non-research payments from the pharmaceutical industry and to identify if there is a measurable monetary threshold at which there is an association between pharmaceutical payments to Ob/Gyn physicians and prescribing practices.

Methods: This retrospective cross-sectional analysis linked two publicly available datasets for 2014-2019: the Open Payments Database and the Medicare Part D Prescriber Public Use Files. We included all Ob/Gyn physicians who appeared in the Physician Compare National Database, a directory of physicians enrolled in Medicare, and the Medicare Part D Prescriber File. We computed descriptive statistics and used chi-squared and Student's t or non-parametric equivalents to compare branded prescribing practices of physicians. Linear regression was used to determine if there was a relationship between payments to physicians and the number of branded prescriptions.

Results: 38,000 Ob/Gyn physicians were identified in the database. 4,409 (13.1%) physicians received non-research payments from the pharmaceutical industry. Ob/Gyn physicians who received payments from the pharmaceutical industry were more likely to be male (48.8% vs. 44.9%; OR(95% CI): 1.2(1.1-1.3);p<0.001). Physicians who were in the highest quartile of payments (>\$150) were more likely to be male (54.8% vs. 45.1%; OR(95% CI):1.5(1.3-1.7);p<0.001) and to be Female Pelvic Medicine and Reconstructive Surgeons (FPMRS; 9.4% vs. 1.3%; OR(95% CI):17.3(14.7-20.3);p<0.001) and had more total prescription claims: median(rng): 2,733 (148-152,426) vs. 616 (69-152,352);p<0.001 but not a higher percentage of branded claims (31.7% (5.6-94.3%) vs. 32.0% (3.3-100%);p=0.72). Total payment amounts were highly skewed (\$0-\$648,382;p<0.001) and we found no relationship between total amount of payments and percentage branded prescriptions (β =-0.02;p=0.307).

Conclusions: Prior research has demonstrated a relationship between non-research payments from the pharmaceutical industry and brand name prescribing, we did not find this. This may be because we were unable to capture some of the most frequently branded prescriptions in the Ob/Gyn specialty, such as branded estrogen preparations. Our study only includes Medicare beneficiaries, which may not reflect all women or prescribing habits of disease. Further studies are needed to determine if this survival advantage for Hispanic identified patients persists.

8:25-8:30AM

Open Questions

8:30-8:40AM

Cervical Dysplasia and Sexual Dysfunction

Resident: Jenny Christl, MD

Primary Mentor: Christine Conageski, MD, MSc

Background: Women who are sexually active have an 80-90% lifetime risk of acquiring human papillomavirus (HPV) anogenital infection. There are well-defined prevention and screening strategies in place for the management of HPV related lower genital tract dysplasias, however there is limited knowledge and data regarding the impact of HPV-related diagnoses and treatments on women's psychosexual well-being. Women diagnosed with cervical dysplasia may be at higher risk for sexual dysfunction likely as a result of multifactorial organic and psychological side effects. Yet, to our knowledge, no validated sexual dysfunction scale for use in this specific population of women exists.

Objective: To develop and validate a questionnaire to assess sexual dysfunction among premenopausal women with cervical dysplasia.

Study Design: We developed a questionnaire through a comprehensive review of the literature, and consultation with specialist clinicians, to establish face validity of the scale. We then recruited patients from dysplasia clinic at University of Colorado Hospital (UCH) to participate in virtual cognitive interviews, using a structured guide, to establish question comprehension, recall, judgment, and responses. When cognitive interviews are completed, we plan to revise the scale in an iterative process, using rapid thematic analysis, until a final version is developed. We will then administer the survey to 150 women presenting to dysplasia clinic at UCH, and finally will determine the internal reliability of the newly developed scale using psychometric testing.

Results: Cognitive interviews are currently in process. Initial themes have emerged, suggesting ways to revise survey structure and improve question phrasing.

Conclusion: Pending the completion of survey validation, we will have developed a tool to investigate sexual dysfunction among patients with cervical dysplasia.

8:40-8:45AM

Open Questions

8:45-8:55AM

Changes in Practice Patterns for Urogynecology Cases in Massachusetts: Is There a Trend Toward Subspecialization?

Resident: Erin Franks, MD

Primary Mentor: Tyler Muffly, MD

Additional Mentor: Lauren Cadish, MD

Objective: Surgical specialties have observed that accreditation of a new subspecialty is associated with a decrease in surgical case volume among non-fellowship trained physicians. Female Pelvic Medicine and Reconstructive Surgery (FPMRS) gained subspecialty certification in 2012. We aimed to assess trends in urogynecologic surgical volume among recently graduated generalist OBGYNs, veteran generalist OBGYNs, and board-certified FPMRS over eight years, using a statewide database.

Methods: We obtained retrospective, statewide data from 2007-2014 from the Massachusetts Center for Health Information Analysis. All pelvic floor procedures for prolapse or stress incontinence performed in Massachusetts were included. Surgeon identifiers were cross-referenced to a second dataset with provider demographics. Pelvic floor surgeries performed by generalist OBGYNs who were five years or less out of residency during the study period, were grouped together as “recently graduated generalist OBGYNs”. Generalist OBGYNs 20 to 25 years out of residency, were grouped as “veteran generalist OBGYNs”. OBGYNs with FPMRS board-certification were the third group. ANOVA tests were used to compare each groups’ case volume per year. Analysis was completed using R software.

Results: 16,423 pelvic floor surgeries were performed by 653 physicians, including 7,299 by 37 FPMRS board-certified physicians. Generalist OBGYNs (n=443) performed 6,287 cases, an average of 1.8 cases per generalist per year, compared with FPMRS (n=37) who performed 7,299 cases, an average of 24.7 cases per year, in the same time frame. The number of FPMRS increased over the time frame, starting with 2 in 2007 to a maximum of 37 in 2014. Veteran generalists performed significantly more urogynecology cases than recently graduated generalists (5.7 vs 2.3, $p < 0.01$) from 2007 to 2014 in Massachusetts. The number of prolapse and incontinence surgeries performed by generalist OBGYNs decreased starting in 2012, the year that FPMRS became a board-certified subspecialty (mean of 9.9 vs 3.9 per year, $p = 0.02$).

Conclusions: Recently graduated generalist OBGYNs are performing fewer prolapse and incontinence procedures than in the past. The FPMRS specialty must ensure that there is adequate workforce to provide this care. They must also recognize the consequences of concentrating these services among subspecialists while the workforce is expanding.

8:55-9:00AM
Open Questions

9:00-9:10AM

Herbal Supplement Use Among Reproductive-Aged Women in an Academic Infertility Practice

Resident: Julie Friedman, MD

Primary Mentor: Alex Joel Polotsky, MD, MS

Additional Mentors: Jeanelle Sheeder, MSPH, PhD; Aaron Lazorwitz, MD, MSCS

Objective: Use of herbal medicines and supplements remains an under-researched topic in female healthcare and fertility enhancement. We aimed to address the knowledge gap surrounding herbal medicine and supplement usage patterns and supplement-prescription medication interactions among patients seeking treatment for infertility.

Methods: We conducted a cross-sectional survey study among reproductive-aged female patients at an academic infertility practice from 01/2021- 07/2021. Participants completed an electronic survey that assessed use of herbal medications and supplements, baseline demographics, and history of infertility treatments. We evaluated for potential supplement-medication interactions using the Natural Medicines Interaction Checker. Quantitative analysis was performed using chi-square and independent medians tests.

Results: We surveyed 100 participants with a mean age of 35.3(\pm 6.1) years. Overall, 68.7% of patients reported ever having used supplements. Current use of herbal supplements and vitamins was reported by 43.4% and 93.0% of subjects respectively with a mean of 5.1 supplements per person. There were no significant associations between patient demographics, comorbidities, or infertility treatments with increased rates of supplement use. The most commonly used herbal supplements were: green tea (n=16), combination product (n=16), chamomile (n=13), peppermint (n=10), raspberry leaf (n=10), elderberry (n=9), turmeric (n=9), ginger (n=8) and cannabidiol (n=6) with the most common modalities being pills/capsules (23.3%) and tea (42.9%). The most common reasons for use were: general health and wellness (24.1%), immune support (16.9%), stress (15.4%), and fertility (13.8%). Patients used maca (n=5), chasteberry (n=3), goji berry (n=2), ginger (n=2), yam-based progesterone (n=2), and combination product (n=2) for fertility purposes. A total of 32.5% of supplements were disclosed by patients to their provider. We identified 50 moderate risk supplement-medication interactions with 14 of these interactions attributed to infertility therapies. In terms of safety in pregnancy cannabidiol, chasteberry, and raspberry leaf were suggested to be possibly unsafe in pregnancy.

Conclusions: We found over two-thirds of women seeking treatment for infertility reported past and current herbal medicine and supplement use. Notably, the Natural Medicines Interaction Checker suggested high rates of moderate risk supplement-drug interactions and possible harmful effects in early pregnancy. Our results call for further investigation of clinically relevant supplement interactions with infertility therapies.

9:10-9:15AM
Open Questions

9:15-9:25AM

Preconception Counseling: Understanding the Patient Experience

Resident: Parisa Khalighi, MD

Primary Mentor: Teresa Harper, MD

Additional Mentors: Virginia Lijewski, MPH; Jeanelle Sheeder, MSPH, PhD

Background: Preconception visits offer an opportunity to review patients' medical conditions and history that could impact future pregnancy or health. There is limited research on the impact of physician recommendations on patient experience and satisfaction.

Objective: To determine if agreement between physician documentation and patient recollection of health conditions discussed at preconception visits is associated with improved patient understanding of conception recommendations and visit satisfaction.

Study Design: This was a prospective study of patients receiving preconception care by Maternal-Fetal Medicine physicians with the University of Colorado School of Medicine from April 2020 through September 2021. Patient demographics and medical histories, discussed health conditions, and conception recommendations were abstracted from the medical record. Patients completed a one-week post-appointment electronic survey and were asked to recall health conditions discussed, recommendations given, and satisfaction with the visit. Kappa (κ) statistics were used to assess agreement between patients and physicians.

Results: 154 patients were enrolled; 46% were >35 years old, 93% married or partnered and 82% identified as non-Hispanic White. Four conditions discussed had moderate agreement: advanced maternal age ($\kappa=0.77$), prior poor obstetric outcomes ($\kappa=0.66$), hypothyroidism ($\kappa=0.66$), and anxiety ($\kappa=0.62$). Three conditions had minimal to no agreement: genetic carrier ($\kappa=0.068$), uterine, cervical, or tubal abnormality ($\kappa=0.162$), and COVID-19 ($\kappa=0.31$). Patient satisfaction and understanding of recommendations did not significantly differ between patients with low and high agreement of conditions (low agreement: 80% satisfied, 80% understanding; high agreement: 82.8% satisfied, 80% understanding). Patients with high agreement regarding conception recommendations were more satisfied with their preconception care (88.3%) compared to patients with low agreement (67.4%) ($p<0.01$).

Conclusion: Our findings demonstrate high patient satisfaction and subjective understanding of conception recommendations for patients seeking preconception care. Agreement between patients and physicians regarding final conception recommendations did adversely impact satisfaction and understanding. Prospective studies investigating the role of conception recommendations on future pregnancy, pregnancy course, and outcomes are needed to improve preconception care.

9:25-9:30AM

Open Questions

9:30-9:45AM

BREAK

9:45-9:55AM

Substance Use and Anxiety About Pain Among Patients Seeking Abortion Services

Resident: Megan Masten, MD

Primary Mentor: Aaron Lazorwitz, MD

Additional Mentor: Jeanelle Sheeder, MSPH, PhD

Objective: There is a paucity of data published about patients who use substances and their experiences with abortion. The objective of this study is to evaluate how recent use of opioids, marijuana, or cannabidiol (CBD) affects pre-procedure pain-related anxiety for patients seeking abortion.

Methods: We conducted a prospective cross-sectional study of patients, aged 18+, presenting for elective abortion at an academic family planning clinic between November 2020 - September 2021. We assessed recent use (within 3 months) of marijuana, CBD, and opioids and asked participants to rate their anxiety about pain during and after their medical/surgical abortions anonymously on a 0-10 scale using a validated survey. We calculated median anxiety scores and compared recent users to non-users using Mann-Whitney U tests.

Results: Among 217 participants, median anxiety scores were 6.0 (range 0-10) for pain during and after abortion. Recent opioid users (11/217, 5.3%) reported higher anxiety about pain after the abortion compared to non-opioid users (8.0 vs 6.0, $p=0.01$). There were no significant differences in anxiety scores between marijuana or CBD users and non-users. Participants who were unsure of their desired abortion type as well as patients without history of prior abortions both reported higher anxiety about pain after their abortion compared to all other participants (7.0 vs 6.0, $p=0.01$; 7.0 vs 5.0, $p=0.04$; respectively). There were no differences in anxiety scores for pain during or after abortion between participants planning on medical versus surgical abortions.

Conclusions: Recent opioid users as well as patients who are unsure of what type of abortion they want to proceed with and have never had an abortion before may have more anxiety about pain. This may be due to greater anxiety at baseline for patients using opioids and anxiety about not knowing what to expect for patients who are unsure of the type of abortion they would like and for patients without a history of previous abortion. These patients may benefit from directed counseling about pain expectations so as to address their increased anxiety about abortion-related pain.

9:55-10:00AM

Open Questions

10:00-10:10AM

Single Agent Carboplatin Induction in Frail Women with Advanced Stage Ovarian Cancer

Resident: Robyn Shaffer, MD

Primary Mentor: Kian Behbakht, MD

Additional Mentors: Marisa R Moroney, MD; Jeanelle Sheeder, MSPH, PhD

Objectives: While previous research has suggested that single-agent carboplatin may be an effective first-line chemotherapy in advanced stage ovarian cancer, the recent Elderly Women with Ovarian Cancer study found worse progression-free survival in carboplatin-only chemotherapy. This retrospective cohort assessed how frail women deemed unable to start dual-agent chemotherapy (DAC) tolerate single-dose single-agent induction (SAI) and subsequent standard chemotherapy cycles.

Methods: We reviewed electronic health records at the University of Colorado Hospital from January 1, 2010 to June 1, 2021 to identify patients of all ages with advanced stage ovarian cancer. We abstracted patient characteristics for all patients undergoing either SAI followed by DAC or DAC alone. We also calculated Modified Frailty Index (MFI) scores for both groups. We described the primary outcome of number of chemotherapy cycles tolerated between SAI and DAC patients. Data analysis was performed with Stata/BE 17.0.

Results: We identified four cases where a SAI carboplatin regimen was utilized for Stage IIA-IV ovarian cancer. In the SAI group, median age was 81.6 years (range 73.1 to 83.3 years) and all had multiple medical co-morbidities, most commonly hypertension, atrial fibrillation, and type 2 diabetes. The median MFI score was 4 (range 1 to 4). No SAI patient was optimally de-bulked, due to disease severity or surgical risk. The DAC group (N=64) was younger (median age 61.8, range 39.2-82.4; $p<0.001$) and less frail (median MFI score 0, range 0-4; $p=0.002$).

All SAI patients received subsequent chemotherapy: one received paclitaxel only due to renal failure, while three received DAC for a total of at least 6 cycles. Of the DAC alone group, 56 (86.2%) completed six cycles of chemotherapy; in DAC patients > 75 years, only three (42%) completed six cycles.

Conclusions: Physicians continue the search for balanced oncogeriatric care; clinical outcomes remain poor. Carboplatin monotherapy as induction chemotherapy is feasible. Future assessment of its efficacy may benefit from prospective identification of frail patients and their clinical outcomes.

10:10-10:15AM

Open Questions

10:15-10:25AM

Racial and Ethnic Disparities in Fertility Awareness Among Reproductive-Aged Women

Resident: Dana Siegel, MD

Primary Mentor: Alex J. Polotsky, MD, MS

Additional Mentor: Jeanelle Sheeder, MD

Objective: To assess any racial or ethnic disparities in fertility-related knowledge among a diverse group of reproductive-aged women.

Methods: We conducted a cross-sectional survey of people self-identifying as female, ages 18 to 45 years old, via Amazon Mechanical Turk in August 2020. The study was approved by the institutional review board at the University of Colorado. The survey consisted of demographic questions and a validated questionnaire, the Fertility & Infertility Treatment Knowledge Score (FIT-KS). Participants self-identified as non-Hispanic White (NHW) or “minority” race/ethnicity. The primary outcomes were to compare the overall score on the FIT-KS instrument and in the sub-categories of questions as it relates to participant demographic characteristics. We used Student’s t-tests or non-parametric equivalents for continuous variables and chi-squared or Fisher’s exact test for categorical or dichotomous variables. Variables significant ($p < 0.1$) in bivariate comparisons and Minority group were entered into a linear regression model to predict percent correct on the FIT-KS scale.

Results: A total of 476 women completed the survey, 405 of whom were included in analysis. Of those, 54.6% self-identified as NHW and 45.4% were in the Minority group. The median FIT-KS score was 51.7% (16 items answered correctly). The Minority group scored significantly lower than the NHW participants overall (58.6% vs. 48.3%, $p < 0.001$) and in all three subscales ($p < 0.05$). These differences persisted when the Minority group was divided into non-Hispanic Black, Hispanic, and non-Hispanic Other (racial group other than White or Black/African American). The Minority group was significantly more likely to underestimate the rate of miscarriage (47.3% vs 32.6%, $p = 0.003$) and had a lower awareness of risk factors that can impact fertility including smoking (88.7% vs. 71.6%, $p < 0.001$), obesity (90.5% vs. 70.5%, $p < 0.001$) and/or a history of gonorrhea/chlamydia infection (83.7% vs. 64.7%, $p < 0.001$).

Conclusion: Minority women appear to present with a lower fertility awareness than their NHW counterparts, as assessed by a well-validated survey. Addressing these disparities and improving fertility education in diverse communities may lead to a reduction in clinically significant infertility disparities.

10:25-10:30AM

Open Questions

10:30-10:40AM

Outcomes for Obstetrician or Midwifery Intrapartum Care in Low-Risk Hospital Deliveries

Resident: Natalie Taylor, MD

Primary Mentor: K. Joseph Hurt, MD, PhD

Collaborators: Virginia Lijewski, MPH; Trisha Agarwal, BS; Jessica Anderson DNP, CNM, WHNP; Denise Smith, CNM, PhD; Jeanelle Sheeder, MSPH, PhD

Objective: To evaluate differences in mode of delivery, labor interventions, and maternal and neonatal adverse outcomes in low-risk pregnant patients receiving intrapartum care managed by obstetricians (OBs) or certified nurse-midwives (CNMs).

Methods: We performed a retrospective cohort study using prospectively collected perinatal data from the University of Colorado Hospital (2013-2018). The sample included healthy nulliparous and multiparous patients with induced and spontaneous labor carrying term, singleton, vertex fetuses who were managed by OB or CNM providers. We included patients undergoing trial of labor after cesarean. Patients were excluded if they had a planned cesarean delivery or any high-risk diagnosis requiring pre-labor transfer to OB care (e.g., fetal anomalies, growth restriction, and any serious maternal medical problems). Using an intention-to-treat analysis, we compared demographic characteristics, mode of delivery, labor interventions, and adverse maternal and neonatal outcomes using appropriate bivariate statistics. We performed logistic regression to adjust for confounders.

Results: Our cohort included 7,694 patients who received care from OB (n=3,543) or CNM providers (n=4,151). The overall cesarean rate was 11.8%. CNMs had a significantly lower cesarean rate (8.9 vs. 15.2%; $p<0.01$), including when analyzed by parity. Adjusting for maternal and pregnancy characteristics, CNM care was associated with a lower risk of unplanned cesarean birth (aOR 0.49 [95% CI 0.40-0.60]). Patients receiving OB care had higher rates of adverse maternal outcomes (intra-amniotic infection, blood transfusions, and severe maternal morbidity) and a higher maternal adverse composite outcome (23% vs 18%, $p<0.01$). CNM patients had higher rates of shoulder dystocia (3% vs 2%, $p<0.01$). OB patients more frequently experienced induction/augmentation, neuraxial anesthesia, and operative vaginal delivery.

Conclusions: Overall, the rate of unplanned cesareans in low-risk patients was lower than national averages. However, CNM patients had higher rate of vaginal delivery, suggesting differences in labor management by OBs and CNMs might contribute. It is possible that integration of CNM care in labor and delivery units could decrease the incidence of unplanned cesarean deliveries. Additional research should focus on the mechanisms underlying our findings and how to best optimize these two providers' collaboration to provide high-quality, patient-centered care.

10:40-10:45AM

Open Questions

10:45-11:00AM

BREAK

11:00-11:30AM

Guest Speaker

J. Christopher Carey, MD

11:30-12:00pm

LUNCH & AWARDS CEREMONY

Residents & Fellows Medical Student Teaching Awards

AAGL Excellence in Minimally Invasive Gynecology Resident Award

Resident Award for Excellence in Female Pelvic Medicine & Reconstructive Surgery

The Ryan Program Resident Award for Excellence in Family Planning

Society of Gynecologic Oncology Resident Award

Society for Maternal Fetal Medicine Resident Award for Excellence in Obstetrics

Society of Reproductive Endocrinology and Infertility Resident Award for Excellence in REI

National Society of OB-GYN Hospitalists Outstanding Resident of the Year Award

The North American Society for Pediatric and Adolescent Gynecology Outstanding Resident Award

Society for Academic Specialist in General OB-GYN Faculty Award

Association of Professors of Gynecology & Obstetrics Excellence in Teaching Award

Ronald S. and Jane Holtz Gibbs Award for Most Outstanding Research Presentation

Resident Publications 2021-2022

Cantwell, Christopher J. MD; Moroney, Marisa R. MD; Sheeder, Jeanelle PhD; Guntupalli, Saketh R. MD. Assessing Inequities in Cervical Cancer Quality of Care and Survival Related to Ethnicity and Socioeconomic Factors, *Journal of Lower Genital Tract Disease*: July 2021 - Volume 25 - Issue 3 - p 205-209.

Jimenez-Zambrano A, **Feller K**, Rivera C, Marchin A, Bolanos AG, Asturias E, Rodas H, Harrison MS. Perspectives of Obstetricians and Women with a History of Prior Cesarean Birth Regarding Subsequent Mode of Birth in Trifinio and Coatepeque, Guatemala. *Obstet Gynecol Res*. 2022;5(1):10-19. PMID: 35198983.

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